# The Journal
of the
# Mysore Agricultural
and
# Experimental Union

Vol. XV
Published—1935

PRINTED AT THE BANGALORE PRESS, MYSORE ROAD
BANGALORE CITY
1936

IMP. INST. ENT.
— LIBRARY —
25 JAN 1937
SERIAL
SEPARATE

# CONTENTS.

Vol. XV.

**No. 1.**


| | Page |
|---|---|
| The Sixteenth Annual General Meeting of the Mysore Agricultural and Experimental Union .. .. .. | 1–20 |
| Welcome Address—By the Vice-President, Mr. B. Sreenivasiengar, Jodidar, Anekal .. .. .. .. | 1–10 |
| Annual Report for 1934—By the Secretary .. .. | 10–15 |
| Speech—By Mr. N. Madhava Rau, B.A., B.L., Revenue Commissioner in Mysore .. .. .. .. | 15–20 |
| Paddy Breeding Station, Nagenahalli—By S. V. Sharma, Junior Assistant Botanist .. .. .. .. | 21–30 |
| Sheep-Pox—By G. N. Srikantaiah, G.M.V.C. .. .. | 30–32 |
| Is Food Grown with Commercial Fertilizers Not Good for Health?—By N. V. .. .. .. .. | 32–33 |
| SELECTIONS— | |
| The Average Butter Fat of the Milk of Various Dairy Animals .. .. .. .. .. | 34 |
| Paper, Etc., from Bagasse .. .. .. .. | 34 |
| A Ginger Manurial Experiment .. .. .. | 34 |
| Irrigation of Rice Fields in the Tropics .. .. .. | 34–35 |
| How to Deal with Nut Grass .. .. .. .. | 35 |
| The Age Factor in Farming .. .. .. .. | 36 |
| Electrical Developments in Russia .. .. .. | 36–37 |
| Budding and Grafting Trials with Cotton and Related Plants | 37–38 |
| Exceptional Yields of Wheat .. .. .. | 39–40 |
| Cotton: Characters of a Superior Variety .. .. | 40–44 |
| The Maynard Ganga Ram Prize .. .. .. .. | 45 |


**Nos. 2 & 3.**


| | |
|---|---|
| Dr. Leslie C. Coleman, C.I.E., M.A., Ph.D.: An Appreciation—By Sir T. Vijaya Raghavachari .. .. .. | 47–49 |
| Experiences regarding Cultivation and Curing of Virginia Tobacco—By T. S. Raghavachar, B.A., Land Owner, Kadgodi, Whitefield .. .. .. .. | 49–59 |
| Botany of Groundnut (*continued*)—By V. K. Badami, L.Ag., Ph.D. (CANTAB.) .. .. .. .. | 59–70 |
| Sheep Breeding in Mysore—By Lieut. A. A. Monteiro, G.B.V.C., Live-Stock Expert .. .. .. .. | 70–88 |
| SELECTIONS— | |
| Is it Possible to Ascertain whether Ewes or Goats are Pregnant by Examination of the Urine? .. .. | 89 |

Page

Farmers' Life: Prince of Wales on Their Difficulties .. 89–90
Examination of Samples of Indian and Foreign Coriander (*Coriandrum sativum*) .. .. .. .. 90–91
Mr. Souter on the Role of Specialist and Interdepartmental Co-operation .. .. .. .. .. 91–92
Potato Growing in Victoria: No. 4—Plant Food Requirements .. .. .. .. .. .. 92–95
Preliminary Observations on Coffee Roots in Kenya .. 95–99
The Coffee-Planting Industry in South India .. .. 99–112
The Cultivation of Tobacco with Particular Reference to Cigarette Tobacco and the Flue-Curing Process . .. 112–124

**No. 4.**

Leaf Blight and Foot Rot of Ragi (*Eleusine coracana*)—By N. S. Venkatakrishnaiya, B.Sc., Junior Assistant Mycologist .. .. .. .. .. .. 125–129
Sugarcane Borer Control in the Mysore State—By T. V. Subrahmanya Aiyar, DIP. IN AGRI., Entomologist, and C. V. Ramiah, Superintendent, Irwin Canal Farm .. 130–136
Cultivation of Turmeric in Hassan Taluk—By N. Ramanna, B.Ag. .. .. .. .. .. .. 136–140
*Arachis hypogæa,* Linn. Groundnut or Peanut: Original Habitat and its Distribution in the World—By V. K. Badami, L.Ag., Ph.D. (CANTAB.) .. .. .. 141–154
Editorial .. .. .. .. .. .. 154–155
SELECTIONS & ABSTRACTS—
Changing the Sex of Papaw Trees .. .. .. 156
Tobacco: A New Source of Citric Acid . .. .. 156–157
Attitudes of High School Seniors towards Farming and Other Vocations .. .. .. .. .. 157–158
Cooking American Varieties of Rice .. .. .. 158–159
Potato Growing in Victoria: No. 5.—The Use of Artificial Fertilizers .. .. .. .. .. 159–164
Termites or White Ants .. .. .. .. 164–170
Agricultural Marketing in India .. .. .. 170–175
Our Exchange List .. .. .. .. .. 176–178

## ILLUSTRATIONS.


**No. 1.** Page

Plan showing the location of the Paddy Breeding Station, Nagenahalli .. .. .. .. .. 21
Plot of G.E.B. 24 Paddy .. .. .. .. 28
Plot of Manurial Experiments, G.E.B. 24 Paddy .. .. 28
Different Varieties of Paddy and Rice .. .. .. 29
Testing Cooking qualities of Rices .. .. .. 29
Natural infection of Sheep-Pox in Goat .. .. .. 30
Artificial infection of Sheep-Pox for the preparation of Vaccine 30

**Nos. 2 & 3.**

Dr. Leslie C. Coleman, M.A., PH.D., C.I.E. .. .. .. 47
Sowing Tobacco Seed .. .. .. .. 50
Tobacco Seed-Bed ramping .. .. .. .. 50
Shading Young Tobacco Seedlings with Date Leaves .. 51
Spraying Seed-Beds with bordeaux mixture (on the left) .. 58
Seed-Beds with Seedlings ready for planting (on the right) .. 58
Watering Tobacco Seedlings .. .. .. .. 58
Root hairs on the lateral roots of Groundnut plant .. .. 59
Rosette of hairs at the base of the lateral roots .. .. 59
General view of improved village flock, Sabbanahally .. 72
Half-bred sire, Mysore dam and their progeny .. .. 73
Half-bred ewe (Merino *vs.* Mysore) .. .. .. 73
Quarter-bred ram, dense wool full of crimp .. .. 74
A group of cross-bred lambs in Sabbanahally village flock .. 74
A group of cross-bred ewes in Sabbanahally village flock .. 75
Shoulder wool of No. 4 showing fineness and crimp .. .. 75
General view of the Farm flock .. .. .. .. 76
Breeding Ram, Mysore, horned .. .. .. .. 76
Shoulder wool of No. 2 .. .. .. .. .. 77
Breeding Ram (2) and his male progeny .. .. .. 77
Breeding Ram, Mysore, polled .. .. .. .. 78
Breeding Ram (No. 5) and his male progeny .. .. 78
Shoulder wool, Mysore Ewe .. .. .. .. 79
Farm-bred Lambs, Mysore .. .. .. .. 79
Farm-bred Mysore Ewe (left); Village Ewe (right) .. 80
Merino Rams .. .. .. .. .. 80
Double-half Ram and Ewe and their progeny .. .. 80
Yearlings: Sire, Merino; Dam, Double-half Ewe .. .. 81
Mysore Lamb (left); Double-half Lamb (right) .. .. 81
Shoulder wool of Double-half Ewe .. .. .. 82
Double-half Rams with and without wool on the belly .. 82

Page

Quarter-bred Ram, horned .. .. .. .. 83
Quarter-bred Ram, polled .. .. .. .. 83
Quarter-bred Ram, Lamb .. .. .. .. 84
Five-eighth-bred Ram .. .. .. .. .. 84
Various types of wools, local and improved .. .. 85
Root systems of Coffee in Kenya—
Plates Nos. 1 and 2 .. .. .. .. .. 96
Plates Nos. 3 and 4 .. .. .. .. .. 97
Plates Nos. 5 and 6 .. .. .. .. .. 98

**No. 4.**

Bore Gowda, The Mysore Farmer .. .. .. 125
Leaf Blight and Foot Rot of Ragi—
A. An affected culm of local *Hullubele* .. .. 126
B. An affected earhead .. .. .. .. 126
Sugarcane Borer Control in the Mysore State—
Plate I, A. & B. .. .. .. .. .. 131

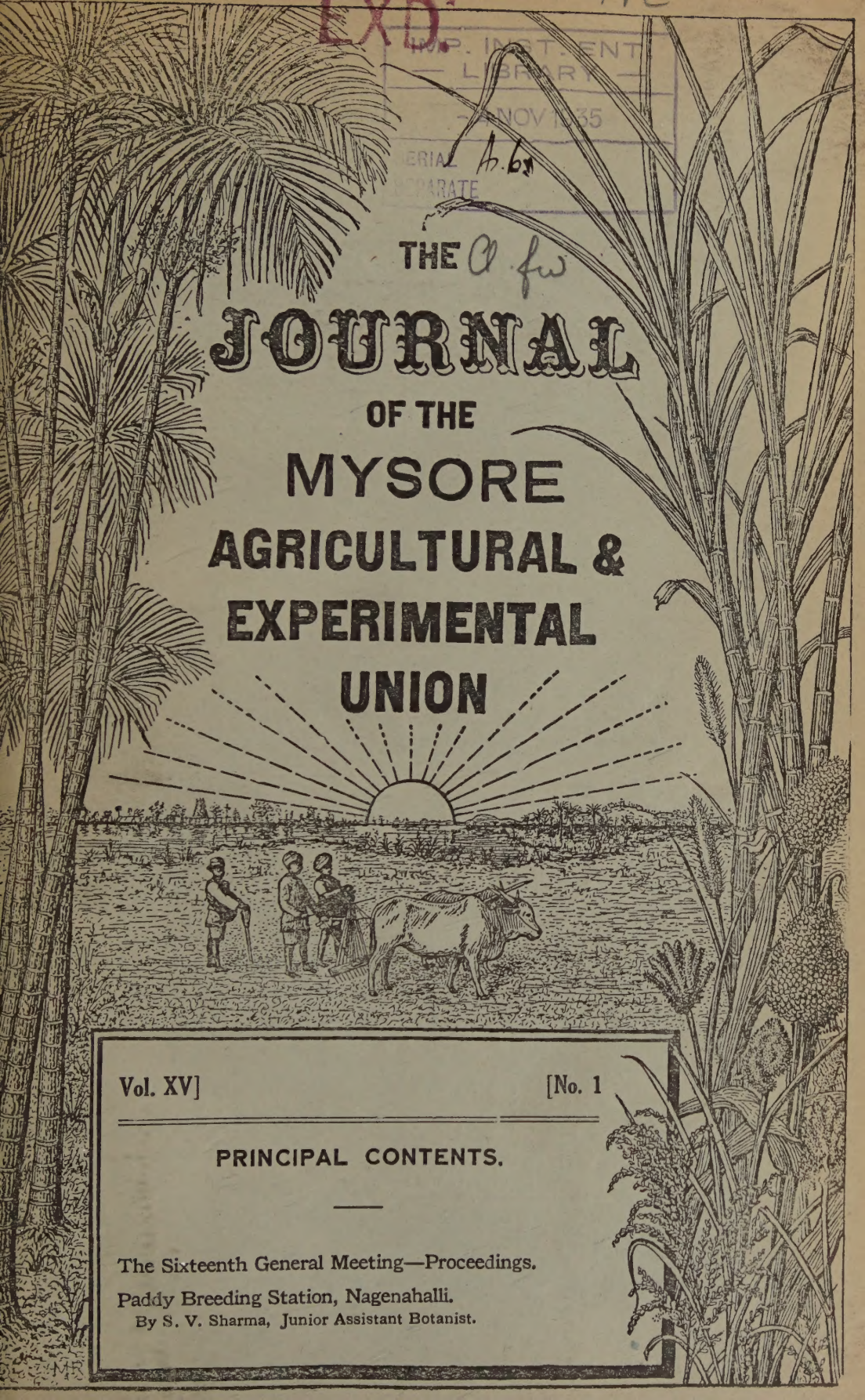
EXD.
IMP. INST. ENT
LIBRARY
NOV 1935
ERIAL
PARATE
A.6

THE

# JOURNAL

OF THE

# MYSORE AGRICULTURAL & EXPERIMENTAL UNION



Vol. XV] [No. 1

PRINCIPAL CONTENTS.

The Sixteenth General Meeting—Proceedings.

Paddy Breeding Station, Nagenahalli.
By S. V. Sharma, Junior Assistant Botanist.

CONTENTS.


PAGES

The Sixteenth Annual General Meeting of the Mysore Agricultural and Experimental Union—

Welcome Address—*By the Vice-President, Mr. B. Sreenivasiengar, Jodidar, Anekal* .. .. .. .. 1

Annual Report for 1934—*By the Secretary* .. .. .. 10

Speech—*By Mr. N. Madhava Rau, B.A., B.L., Revenue Commissioner in Mysore* .. .. .. .. 15

Paddy Breeding Station, Nagenahalli—
*By S. V. Sharma, Junior Assistant Botanist* .. .. 21

Sheep-Pox—
*By G. N. Srikantaiah, G.M.V.C.* .. .. .. .. 30

Is Food Grown with Commercial Fertilizers Not Good for Health?—*N. V.* .. .. .. .. .. .. 32

SELECTIONS—

The Average Butter Fat of the Milk of Various Dairy Animals—Paper, etc. from Bagasse—A Ginger Manurial Experiment—Irrigation of Rice Fields in the Tropics—How to Deal with Nut Grass—The Age Factor in Farming—Electrical Developments in Russia—Budding and Grafting Trials with Cotton and Related Plants—Exceptional Yields of Wheat—Cotton .. .. .. 34

The Maynard Ganga Ram Prize .. .. .. .. .. 45


## NOTICE

**Members and Subscribers are requested to intimate promptly to the Union Office change of their address as otherwise, letters and journals sent to them are likely to be delayed or missed altogether.**

The Journal
of the
# Mysore Agricultural
and
# Experimental Union

Vol. XV] [No. 1

## THE SIXTEENTH GENERAL MEETING OF THE MYSORE AGRICULTURAL & EXPERIMENTAL UNION

Held on the Irwin Canal Farm, Mandya
on 29th March 1935

### Welcome Address delivered by the Vice-President Mr. B. Sreenivasiengar, Jodidar, Anekal

MR. CHAIRMAN, DR. NARASIMHA IYENGAR, FELLOW-MEMBERS OF THE MYSORE AGRICULTURAL AND EXPERIMENTAL UNION AND GENTLEMEN,

I rise to welcome you all to the Sixteenth Annual General Meeting of the Mysore Agricultural and Experimental Union. Some of you have travelled long distances to attend this annual function. It is a source of pride to the management that in spite of the many great disabilities under which we are working and disappointments we have to face, there are yet so many enthusiasts among our members who think that it is yet worth their while to undertake this long journey to Mandya to attend our annual gathering. I do not know to what extent the arrangements we have made here for your comforts are in proportion to your needs but I can assure you that those who are concerned with the arrangements have spared no pains to make your stay here interesting,

instructive and comfortable. If you remember that we are meeting in a place seven miles away from the nearest Taluk headquarter town and some twenty-five miles from the nearest City of Mysore, you can realise how difficult it is to provide comforts which some of you are accustomed to. I, therefore, crave your indulgence for any shortcomings which you may experience.

We are meeting at the end of a year which is considered disastrous in many parts of the State. The monsoons have failed and in some parts of the State there is a great deal of scarcity of drinking water and fodder. On this matter, our Chairman, the Revenue Commissioner, and our friend, the Director of Agriculture, can give you much more authoritative information than I can. Since three or four years, the agriculturist is being hit very hard due to fallen prices. Prices of certain products have improved now but there is not much to sell and the agriculturists' lot continues as hard as before. It is not my purpose to-day to discuss these and kindred matters but I feel I will be considered to have failed in my duty if I do not draw the attention of everybody concerned to the most unfortunate position in which the agriculturist finds himself to-day. He never before deserved more understanding sympathy and real help than now.

I shall now proceed to say a word or two on matters of immediate interest to us—members of the Union. We are, as you know, a body of agricultural experimenters. That might sound rather an ambitious claim but it is a fact. Eighteen years ago, Dr. Coleman, that great friend of the Mysore agriculturist whose inspiring presence we miss to-day, called us together to find out to what extent we, the educated among the agriculturists, were prepared to join hands with him in an effort to raise the standard of our country's agriculture and improve the lot of the less fortunate among us—the tillers of the soil. The Mysore Agricultural School had been started some years before and was sending out men trained for the purpose of settling on the soil. The number of such trained young men was increasing from year to year.

Dr. Coleman, due to his earnestness, enthusiasm and transparent sincerity of purpose, and above all, his unassuming friendliness with the ryot population, had made many friends among the agriculturists who would be willing to co-operate with the Agricultural Department in any manner found practicable. The Agricultural Department itself had accumulated much valuable experience as the result of laboratory research and field experimentation and was anxious that agriculturists should adopt certain improvements indicated by its work. There were, at the same time, many young officers in that Department whose enthusiasm for work and whose desire to be helpful to the agriculturists was excelled only by their chief. All these men had to be brought together for some great purpose. It is comparatively easy to bring men together for political or academical discussion. But to bring together, the agriculturally-trained farmer with unbounded enthusiasm, the young educated agricultural officer who will swear by his opinions and the conservative farmer who is prone to look with suspicion upon an educated young man who pretended to teach his grandmamma how to suck eggs, to bring such heterogeneous mass together for some great piece of work, the genius of a Coleman was required. So Dr. Coleman called us together and put before us our agricultural problems in his own inimitable way. He told us he had improvements upon our agricultural methods which he could confidently recommend for our adoption on the basis of his Department's work but which had to be tested out in the varying climatic and soil conditions obtaining in the Mysore State. These tests involved a certain amount of expenditure in time and money and some little risk. He wanted them tested out on a small scale in various parts of the country and hoped that he had a right to expect from his students and agriculturist friends a certain amount of co-operation in that work. As for his colleagues, he assured us that they would be helpful in assisting us to conduct these tests and that all facilities would be provided for carrying them out. He did not believe that the mere starting of an

agricultural association would serve any purpose unless that association was willing to do some definite work helpful in advancing the agricultural status of the country. Dr. Coleman's personality and his earnestness won us over to his side and since then uptil now we have known no difference between us and the Department. A feeling of brotherliness exists between our Agricultural Department and the agriculturists of which any Department of Agriculture may justly be proud. We have, for over eighteen years now, we the agriculturists and the Department, worked together having as our common goal the development of the country's agriculture which, according to our motto, is the Hope of the Nation. How far we have succeeded in our attempt I cannot tell. We are yet too near to appreciate the greatness of the small beginnings we have made. Year by year our members have undertaken experimental work. Some have been successful in carrying them out to the finish, others have failed fully or partially, but have mostly learned the lessons which only failures can teach. We intend to continue the great task we set to ourselves many years ago to the best of our capacity and we hope too that the Agricultural Department will accept of us the co-operation which we offer in the same spirit in which it is offered.

I now come to other matters relating to the work of the Union. When we entered upon our work eighteen years ago, we felt we required a medium through which we could inform ourselves on the subject of improved agriculture and its scientific foundations. So, we started an Agricultural Journal in 1919. In the beginning we had only an English Quarterly. As the Union grew in numbers and non-English knowing agriculturists joined it, the need for a Vernacular Journal was felt. A Quarterly Kannada Journal was started in 1920. This Journal was discontinued in 1924, due to insufficient financial support. It was, however, revived from 1928 as a monthly as the result of increased assistance given by our enlightened Government. Through these Journals the Agricultural Department has kept itself in touch with us and other agriculturists. If you will look over its pages you will see

that it is really the Department's Journal and it is natural that it is so, although I realise that it ought to reflect much more than now the work and experience of our members and other leading agriculturists. Our Journals are considered by men who know as second to none in India. They disseminate correct and tested agricultural knowledge to their readers in as simple a language as possible. The English Journal has an extensive exchange list which covers the most important countries on the globe. I am constrained to observe, however, that the response from the reading public to the Journals is very poor compared to the effort the Union is making in popularising them. There are several factors responsible, in my opinion, for this state of affairs. Firstly, the newspaper reading public in this country is small compared with the literate population (which, again, is small as compared with the total population). Secondly, the small newspaper reading public loves to read a kind of literature which is obviously impossible to provide in a Journal devoted to one subject, *viz.*, agriculture. And then, the Journals do not earn anything in the shape of advertisement charges as non-agricultural advertisements are deliberately and rightly eschewed and agricultural advertisements cannot be attracted without a large circulation. We have no separate executive travelling staff to popularise the Journal among the rural parts. We have to depend upon the Agricultural Officers in the districts for whom the popularisation of the Journal is perhaps not a very important matter. Under these circumstances, we have had to depend upon the Government for considerable financial assistance for the publication of the Journals. There seems nothing out of the way in asking for and securing that assistance. The dissemination of correct agricultural knowledge applicable to local conditions is one of the Department's duties. The greater part of that knowledge is obtained as the direct result of the Department's work. The knowledge so secured serves no useful purpose if it is not carried to the doors of those for whom it is meant. Our Journals are really the printed medium through which

the Department carries its information to the literate agriculturists. It happens that, under the circumstances I stated before, the Union started the Journals. As there is really no difference either in the objects or methods of gaining them between the Department and the Union, the Department has not felt the need for another Journal. They have made the Union's Journal their own and very rightly too. Government assistance is really intended to meet the expenses on staff and printing the Journals. If it is said that there is no need for these Journals, I can say nothing excepting that that is a serious mistake and the Journals are quite necessary. But if, on the other hand, the need for these Journals is recognized by Government as, in fact, it has been recognized by the several Dewans and Members of Council who have presided over our meetings, then I ask, are we not right in expecting assistance from Government for work which we are doing and which they should have had to do normally? It seems to me simply a question of budget heads and names. I would, therefore, request our good Director of Agriculture to place the matter before Government properly, and secure for us the continuity of Government's financial assistance which we have been obtaining hitherto.*

But I am not satisfied that the knowledge gathered together so ably in the pages of our Journal reaches even a fraction of the population for whom it is gathered. I am a believer in the utility of organizations for every purpose. We have a large number of rural organizations in the Village Panchayats which ought to be interested in matters connected with rural improvement and what improvement can be greater than that connected with the greatest rural industry—Agriculture? It is the State's main industry. We, therefore, resolved some years ago that an attempt should be made to place a copy of our Vernacular Journal in the hands of at least the more important Village Panchayats. We approached Government in this matter through the then Director,

* The Government have since been pleased to grant subvention to the Union for two years.

Dr. Coleman. Government are very sympathetic but their sympathies have not been adequately transformed into rupees, annas and pies for various reasons which I do not wish to discuss here. We have recently resolved that Government should be requested to purchase 3,500 copies of the Kannada Journal at a reduced subscription of Rs. 2 for distribution among rural organizations. I hope the Director of Agriculture will support our proposals and make it possible for us to be useful to a much larger number of people than now.

You will pardon me, I hope, if I digress for a minute to speak a word or two on the attitude of the public in matters connected with Scientific Research. To a great majority of them, Scientific Research in a Government Department is an evil to be tolerated by a State which wishes to be placed in the front ranks of progressive ones. They think that scientific men waste their time on matters of no practical value. Such an opinion held by the unlettered is excusable, because it is the outcome of ignorance. But I am sorry to say that such an opinion is held by a large section of even our educated public as witnessed by a great deal of uninformed criticism in many public bodies. Dr. Coleman, in his reply to the Address we presented him on the eve of his departure on long leave in July 1925, spoke on this subject these significant words, which, with your permission, I repeat. He said:—

"The natural tendency in human nature is to recognize the value of the obvious and the external. Now, in the work of Agricultural and sister departments, the things of obvious value are the results which have been and are being demonstrated to the agriculturists of the State, and which have already enriched them by many lakhs of rupees. It is, perhaps, somewhat difficult to realise to the full that these results have been obtained only after prolonged scientific investigation and experiment.

* * * *

"I should like here to utter a most solemn warning. If our scientific work is starved, no matter how much money is lavished on demonstration and propaganda, the Agricultural

Department and its sister departments will die and their work will come to nought. To you gentlemen, Members of this Union, who through the work conducted on your own fields, and through your close association with the Agricultural Department, are in a position to appreciate better than others the paramount value of Scientific Investigation, I would like to give the very special and sacred duty of holding aloft the torch of science in our popular assemblies wherever they are held. If you do not do this, I fear, as years go on—and an increasing power of self-government may be given to the people of this State—the supreme value of the scientific work may be overlooked and the structure on which we have spent so many and laborious years in rearing will crumble to the dust.

* * * *

"If the words of your address come from your heart, as I feel they do, if they are more than a mere expression of respect, if they represent a real regard and affection for me, I would most solemnly enjoin you to support the hands of those who are left to carry on this noble work. I believe you can in no other way do more noble service to our beloved and revered Ruler and to the fair land of Mysore which has given you birth."

I can assure you, gentlemen, that we, the members of the Mysore Agricultural and Experimental Union, are fully conversant with the state of affairs referred to by Dr. Coleman. We have not the slightest hesitation in asserting that by starving Scientific and particularly Agricultural Research, the death-knell of all progress is sounded. But we have in Mysore a most enlightened and progressive Government, and there seems to be no fear of Scientific Research being relegated to the background.

Mr. Chairman and Gentlemen, I have taken more time, perhaps, than I should have. But I felt that we ought to, at the present moment, take stock of our position and resolve upon future work, with confidence in our capacity to carry it out. I have a few suggestions to the officers of the Agri-

cultural Department. You are the representatives of scientific agriculture in the districts. I feel it will help you and all concerned if you will take a little more interest than now in the experimental work of the Union in your jurisdiction. Is not the discovery of what is good for your place a source of interest to you? Can you be of use to the agriculturists, for whom you are working, in a better way than that of helping them to make discoveries of improvements in their own fields? If each one of you can persuade four members in your Range to undertake experimental work and help them to carry it out satisfactorily, you will have done more, in my opinion, than giving advice based on something about which you can never be perfectly certain. You come into contact in the course of your tours with many good and capable agriculturists who ought to be our members, and many leaders of rural organizations like Village Panchayats who ought to read our Journal. I beg of you to enlist their sympathies for the Union. The Union depends upon you in popularizing its work in rural parts. Its work is not different from yours. It is your own. Only you do it in the name of the Union of which most of you are members.

Gentlemen, I have now almost finished what I wanted to say. You will, I know, expect me to do one thing and that is to congratulate our friend, Dr. Narasimha Iyengar on his well-merited promotion as Director of Agriculture. You, Sir, have been greatly responsible for the work of the Union in the past. You have edited its English Journal for now nearly twelve years, ably assisted, I know, by our Secretary. As a member of the Committee you have kept a careful watch over the progress of the Union and its work. I ask of you now for nothing more than to continue to take even more interest, if that is possible, in our work and to secure for us Government's financial assistance to enable us to continue our useful work in co-operation with your Department.

We are greatly honoured by Mr. N. Madhava Rau, our able Revenue Commissioner, who consented to preside over this meeting in spite of many other important engagements.

When Dr. Coleman retired from public service in Mysore in February last, you were chosen to take his place in the management and direction of the Mysore Sugar Company. Some of us, who have closely watched the progress of that Company, know how rightly your selection was made and how ably you have discharged the duties placed upon you to the satisfaction of all concerned. We are proud to have you in our midst to-day. I appeal to you, Sir, on behalf of the Union, to do whatever you can to help us on in our efforts to improve Mysore's agriculture.

## Annual Report for 1934
## By the Secretary

It gives me great pleasure to submit this, the Sixteenth Annual Report of the Mysore Agricultural and Experimental Union.

Since we met last in our usual Annual Meeting, many events of importance have happened. Ordinarily the Annual Meeting for the year 1933 should have been held during November of that year in this very place. Under the circumstances mentioned in my previous report, that meeting could not be held. An Extraordinary General Meeting was held in February 1934 to bid good-bye to Dr. Leslie C. Coleman on the eve of his retirement from public service in Mysore. At that meeting, Mr. A. K. Yegnanarayana Iyer, Dr. Coleman's successor in office, was elected President of the Union. He himself went on leave preparatory to retirement early in January this year and resigned his office of President of the Union simultaneously. In accordance with the constitution and rules of the Union, the Vice-President, Mr. B. Sreenivasa Iyengar of Anekal, has been attending to the duties of the President since January 1935.

### Experimental Work during 1933

During 1933, only 12 members undertook to conduct any work at all out of a total number of 173. In Dr. Coleman's words, "It is perhaps rather too much to expect agriculturists, even intelligent and progressive ones, at a time when they

are finding it extremely difficult to cover the expenses of operations on account of the very depressed condition of the market, to devote a large amount of time and money to carry out experiments." Add to this the failure of rainfall and its consequences, the reasons for the hesitation of members to undertake any serious experimental work, become apparent. Yet it is gratifying to record that we have results of 8 successful experiments to discuss to-day. During the year 1934, ten members undertook to conduct trials of various kinds numbering 33 in all. Only one successful experiment has been reported upon. The other experiments have almost all failed due to failure of rains. Members who have taken a great deal of pains to lay out correct experiments and expended a great deal of care and some amount of money, and who find that all their trouble and expense has been to no purpose, deserve at least our sympathy.

### The Journals of the Union

The Kannada Monthly Journal of the Union is being published fairly regularly. The English Journal, however, is quite irregular. Five issues of the English Quarterly yet remain to be published. This is due almost entirely to want of contributors as I have been submitting to you from year to year.

### Finance

Our income is made up of entrance fees, membership fees and subscription to the *Journal* and Government subvention. About this time last year, a deputation of the Union consisting of Messrs. B. Venkatanaranappa and N. Siddalingiah Devaru, waited on the Second Member of Council to impress upon him the necessity of Government sanctioning the subvention to the Union for the years 1933–34 and 1934–35 which the Director of Agriculture had applied for. Government graciously sanctioned the subvention which enabled us to discharge the debts we had incurred and to continue our activities so far. On the 15th of this month, a deputation consisting of the Vice-President, Mr. B. Sreenivasa Iyengar, and Messrs. B. Venkatanaranappa and N. Siddalingiah

Devaru, waited upon the Second Member of Council and represented that the Government should purchase copies of the Kannada Journal for a large-scale distribution among public bodies like Village Panchayats or at least continue the subvention to the Union as heretofore.

The second largest source of our income is from our subscribers to the Kannada Journal. Government very kindly ordered that from 25 to 30 Village Panchayats from each taluk should be selected for subscribing to the Journal and their names intimated to the Director of Agriculture. The Revenue Department has co-operated to some extent in enlisting some of the Village Panchayats as subscribers but the response has not been to any extent what was hoped for. Out of about 11,000 Village Panchayats in the State, 138 are subscribing to the Journal. A deputation, consisting of Messrs. B. Sreenivasa Iyengar, B. Venkatanaranappa and N. Siddalingiah Devaru, waited on the Revenue Commissioner who gave the deputation a very sympathetic hearing.

You will be glad to hear that our members in the Mandya area have resolved upon forming a branch of the Union for the purpose of concentrating upon work useful to the area. The idea of forming branches of the Union originated many years ago. A branch was formed in Hassan in 1928. It did very good work for two years but gradually ceased to exist. The uncertainty of rainfall conditions dissuades many earnest members from undertaking work. It has happened in previous years that experiments have failed in the dry land largely because of the vagaries of rainfall. Paddy and sugarcane experiments have failed due to insufficiency of water in the tanks during the growing period of the crops. Our members in Mandya have an assured supply of water. They have many facilities for work which other members do not have. The Mandya area is therefore best fitted for intensive experimental work. The suggestion that a large number of farmers should be attracted to the Union in the Mandya area and persuaded to undertake experimental work was made by Rajamantrapravina S. P. Rajagopalachari,

Member of Council, when he presided over our deliberations in 1932. It is our hope that the Mandya branch will be an accomplished fact very shortly and that it will enter upon its first year of work almost immediately.

The following is the statement of income and expenditure for the period commencing from 25-2-1934 and ending with 28th February 1935:—

*Statement of Income and Expenditure for the period commencing from 25-2-1934 and ending with 28-2-1935*

| Receipts. | Rs. | a. | p. | Expenditure. | Rs. | a. | p. |
|---|---|---|---|---|---|---|---|
| Opening Balance .. | 254 | 12 | 10 | Establishment .. | 1630 | 3 | 7 |
| Admission Fee .. | 12 | 0 | 0 | Payments to Press .. | 2063 | 14 | 0 |
| Membership Fee .. | 294 | 0 | 0 | Postage .. | 130 | 4 | 0 |
| Subscription .. | 580 | 13 | 0 | Miscellaneous (Stationery, binding, etc.) | 15 | 8 | 0 |
| Miscellaneous .. | 43 | 13 | 0 | Annual Meeting & Field Day .. | nil | | |
| Subvention (for 1933-34 and 1934–35) .. | 5000 | 0 | 0 | Total.. | 3839 | 13 | 7 |
| | | | | *Cash on hand.. | 2345 | 9 | 3 |
| Grand Total.. | 6185 | 6 | 10 | Grand Total.. | 6185 | 6 | 10 |

*Estimated Income and Expenditure for the half year ending with June 1935*

| | Rs. | a. | p. | | Rs. | a. | p. |
|---|---|---|---|---|---|---|---|
| * Press bills pending payment .. .. | 1087 | 9 | 0 | Estimated income from membership fee and subscription for half year ending with June 1935 | 750 | 0 | 0 |
| Estimated cost of printing 6 issues of English Journal and 5 issues of Kannada Journal to be printed before the end of June 1935 | 970 | 0 | 0 | Cash on hand .. | 2345 | 9 | 3 |
| Establishment .. | 544 | 0 | 0 | | | | |
| Annual Meeting & Field Day .. .. | 400 | 0 | 0 | | | | |
| Stamps .. .. | 50 | 0 | 0 | | | | |
| Miscellaneous .. | 40 | 0 | 0 | | | | |
| Total.. | 3091 | 9 | 0 | Total.. | 3095 | 9 | 3 |

N. Venkatasubbaya,
*Secretary.*

*Statement showing the results of Paddy Varietal Tests for 1933.*

| Name of Experimenter | Variety | Area of plot | Average yield per plot | Yield per acre | Remarks |
|---|---|---|---|---|---|
| 1. Mr. Chikputtiah, Dodderi, Madhugiri Taluk. | Nagpur Sanna. | 1 gunta | 41½ srs. | 1,660 srs. | Fetched 8 annas more than the local variety per palla. |
| | Chintamani Sanna. | 1 gunta | 43 srs. | 1,718 srs. | 40 bundles of straw per acre in both cases. |
| 2. Mr. G. S. Venkatesagupta, Yellappanayakanahoskote, Koratagere Taluk. | G. E. B. 24 | ⅔ gunta | 35 srs. | 2,100 srs. | 60 bundles of straw per acre. |
| | Halubbalu. | ⅔ gunta | 20 srs. | 1.200 srs. | 75 bundles of straw per acre. |
| 3. Mr. S. Rangachar, Komarapura, Yelandur. | G. E. B. 24 | 1 gunta | 52 srs. | 2,080 srs. | The wt. of straw could not be taken owing to rains at the time of harvest and threshing had to be hurried through. The low yield of G. E. B. 24 was due to the attack of some disease when the crop was 2½ months old. |
| | Kembuti. | 1 gunta | 55 srs. | 2,200 srs. | |

*Statement showing the results of Groundnut Varietal Tests for 1933.*

| Name of Experimenter | Variety | Area of each plot | Average yield per plot | Yield per acre | Remarks |
|---|---|---|---|---|---|
| 1. Mr. Chikputtiah, Dodderi, Madhugiri Taluk. | Spanish | 1 gunta | 1 md. and 1 sr. | 41 mds. | One viss of empty pods. |
| | Spreading variety. | 1 gunta | 1 md. and 7 srs. | 47 mds. | .. |
| 2. Mr. S. Rangachar, Komarapura, Chamarajanagar Tk. | H. G. 1. | 2 guntas | 105 srs. | 2,100 srs. | 4 seers of empty pods. |
| | Local erect. | 2 guntas | 88 srs. | 1,760 srs. | 9 seers of empty pods. |

*Statement showing the results of Sugarcane Varietal Tests for 1933.*

| Name of Experimenter | Variety of cane | Yield of cane per acre | Yield of Jaggery per acre | Remarks |
|---|---|---|---|---|
| 1. Mr. S. Rangachar, Komarapura, Chamarajanagar Taluk. | Local striped | 16·78 tons | 175 mds. | The plots were treated with the usual dose of artificial manure ($AM_2SO_4$ and super only) and 40 cartloads of cattle manure per acre. |
| | H. M. 320 | 19·70 tons | 244½ mds. | |
| 2. Mr. H. Srinivasa Rao, Varadanahalli in Malur Tk. | Pattapatte | .. | .. | The member used all the cane for seed, and so could not furnish these details. |
| | H. M. 320 | .. | .. | |
| 3. Mr. A. Ramappa, Lingadahalli, Sagar Taluk. | Rasathali | 60,000 canes | 240 mds. | H. M. 320 is superior to the other varieties in all respects such as germination, growth and yield of Jaggery. |
| | H. M. 320 | 1,00,000 canes | 480 mds. | |
| | A. M. 553 | 80,000 canes | 400 mds. | |
| | H. M. 544 | 80,000 canes | 400 mds. | |

## Speech delivered by Mr. N. Madhava Rau, B.A., B.L., Revenue Commissioner in Mysore

I am very grateful to the Vice-President and members of the Union for giving me this opportunity of meeting them this evening and taking part in their Annual Meeting. One naturally feels a little nervous at the prospect of meeting a body of experts, even if they be expert agriculturists, but on this occasion, I am somewhat reassured by the reflection that it is my part not so much to speak as to listen, and I hope to be profited by your deliberations, although I can make no useful contribution to them.

There was a time when the work of the Agricultural Department was little known to the general public and was therefore suspect. It was then possible for a cynic to observe, with more pungency than truth, of course, that the Department was content to spend a couple of thousand rupees in order to produce, let us say, a potato as big as a pumpkin. But botanical and other curiosities, as such, have long ceased to be objects of interest. The slogan about two blades of grass being made to grow where one grew before, represents the severely utilitarian ideal which for many years past has

guided the activities of the Department. And with marketing questions brought to the forefront, it is truer now to say that it aims at getting for the ryot two rupees where he got one rupee before.

The conspicuous success which has attended the activities of the Agricultural Department is to be attributed as much to the agriculturist in the field as to the scientist in the laboratory. To translate into popular practice the lessons derived from experiment has always been the hardest part of the task, here, as elsewhere.

Associations like yours can do a great deal in this direction. But, at the same time, it is necessary to recognise the limitations under which such Associations have to work. We have to remember, even if it be unpleasant to do so, the observations made by the Royal Commission on Agriculture about these Associations. The Commission said:—

"Of other methods of propaganda, agricultural associations, as originally constituted, have, for the most part, hitherto proved a failure. The area from which the members were drawn was usually too large to permit of concentration of activity sufficient to produce any positive results. The lack of a definite task often meant that nothing at all was done. Members were frequently drawn from people whose direct interest in the land was small or the associations depended too much upon the enthusiasm of a single member, while the staff of the agricultural department was too limited to enable them to give the associations the necessary close attention."

Those who are familiar with the work of this Union have pointed out that it is a unique organisation, having nothing in common with the Agricultural Associations started in other parts of India which only led a nominal existence. "The members of the Union," Dr. Coleman said, "agree to carry on in co-operation with the Department fairly rigorous work to test out new varieties of crops, new implements and new methods of cultivation and manuring." The Union represents, in other words, the enlightened agricultural practice and experience of the country, and it is in no sense a body of

amateurs. Having regard, however, to the severe task which the members have set before themselves, I do not think they would be disposed to regard the advice of the Royal Commission conveyed in the above passage to be superfluous.

It is a matter for gratification that the Union has been seriously considering concentration of effort, which is obviously one of the principal conditions of success. The formation of Branch Associations in areas where agricultural conditions are favourable and the problems for solution are limited in range is to be welcomed. The Irwin Canal Tract is well chosen for the purpose and the work of the Mandya Branch which you propose shortly to inaugurate will be watched with interest.

For nearly a century, the Government of this State has actively promoted the introduction of new crops and improved methods of agriculture. A good deal was done during the days of the British Commission. Sir Mark Cubbon was, in this as well as in other directions, the pioneer of beneficent State enterprise. A short but illuminating account of his work will be found in the monograph written by Dr. Venkatasubba Sastri, from which I quote the following passage, because, for a meeting held in the Sugarcane Farm at Mandya, it possesses local as well as topical interest:—

"The Otaheite sugarcane was successfully grown as early as August 1836 in the Seringapatam and other taluks. This gave a stimulus to other experiments in sugar industry. A factory was established, probably with Cubbon's approval, at Seringapatam by a company of Europeans and Mysoreans. The export of sugar and jaggery increased from 180,000 maunds in 1837 to 300,000 maunds in 1842–45. The chief buyers were the Nilgiris and the military stations on the West Coast, the reason for small consumption being the prejudice against the use of blood in the process of its purification. The extent of cane cultivation also increased, and Cubbon said in 1844 that 'it would be difficult to assign a limit to the growth of sugar in Mysore, for the climate and soil seem well adapted, and it is a favourite cultivation with the

farmers', and again in 1855 that 'its (the factory at Seringapatam) operations appear only limited by the quantity of fuel that can be obtained'. The success was so great that a sixteenth of the total revenues of the Bangalore Division was derived from sugar alone. In 1846, the Government of India sent some cuttings of China sugarcane, at the instance of Dr. Royle, who wrote that he found 'mention made of a species of sugarcane, originally imported from China, the introduction of which into Mysore from the peculiar property it is said to possess of resisting the ravages of the white ants and jackals, as well as being more productive and lasting, would, I conceive, be attended with great advantage to the country'. The experiment succeeded. The Mauritius variety was, however, the most useful, and supplanted the inferior cane of the country almost everywhere. In addition to these varieties, Smith mentions the successful introduction of the South Sea variety. The case of cane illustrates beyond all doubt that the cultivator of Mysore was not prejudiced against beneficial changes in agriculture, and was well alive to his interests."

Tea, coffee, cotton, indigo, silk, tobacco, sago, potato, fruit and vegetables received the attention of Sir Mark Cubbon with varying degrees of success or of disappointment. But the abiding results of his work are to be seen in the potato cultivation in the Bangalore and Kolar Districts, the coffee cultivation in the Malnad and the apple orchards near Bangalore. It must, however, be stated that the crops which appealed to Sir Mark Cubbon and his officers were, for the most part, those which were required for export to their home country or for consumption at their own table. But these crops had one great merit, *viz.*, that they commanded a ready market and a good price and this was the secret of their successful cultivation. The administrators of these days had an additional advantage in the fact that the *batayi* system of land tenure then in vogue helped the Government to provide the seed, advance part of the costs of cultivation and to divide the proceeds of the harvest with

the cultivator, paying the latter sometimes in cash for his share. The Government were not merely doctrinaire advocates of modern methods, but participated in the profits as well as the risks of experimental work.

Be it noted that, even in those early days, there were some sort of Agricultural and Experimental Unions which, though they did not bear that name, performed very similar functions. There was for instance an Agri-horticultural Society which, though it was short-lived, provided an organisation for official and non-official workers to come together and take counsel of one another. Then again, there were individual helpers, principally in the coffee-growing areas, who carried out investigations and experiments desired by the Chief Commissioner.

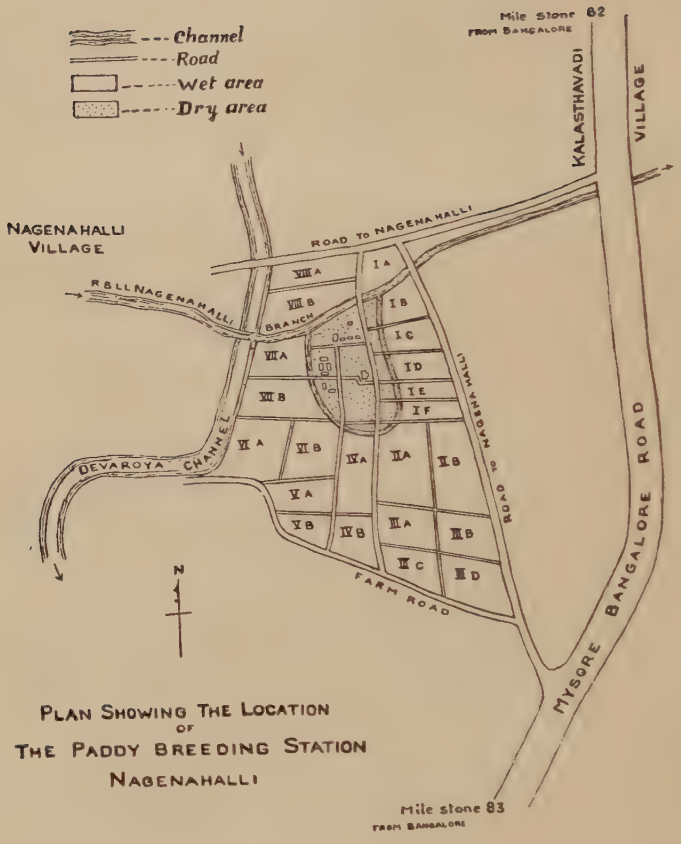
Some of the efforts of Sir Mark Cubbon and his contemporaries might appear to be crude and puny by the side of later scientific achievements. But I was tempted to recall them because in certain respects, they afford a close parallel to the methods by which during the past four or five years, a phenomenal expansion of sugarcane cultivation on modern lines in the Irwin Canal area has been made possible. A few years ago, there was hardly any sugarcane cultivation in this area. Paddy cultivation too was limited. The introduction of irrigation facilities, instead of being welcomed, met with suspicion and even hostility from the ryot population.

But the Government were determined to pursue the scheme to a success. At first, a small Farm was established on the site where we are now met, for purposes of experiment, demonstration and seed supply of sugarcane. But this proved insufficient and it was perceived that if quick results were to be achieved, the question of sugarcane cultivation had to be tackled from the manufacturing and marketing sides as well, and that the traditional method of leaving the most difficult part of the work to potential private enterprise would not be appropriate in the circumstances. A Sugar Factory was, therefore, established at a cost of Rs. 20 lakhs. The Irwin Canal Farm was largely extended and advances

were given to the ryots on an unprecedented scale with the assurance of purchasing the crop at a remunerative price. The adoption of these measures have transformed the outlook of the ryot. We are now confronted, not with indifference on his part which we have to overcome, but with eagerness for growing sugarcane which must be kept within limits. The lesson to be learnt from this is clear. Show the ryot that he can make money, give him facilities for cultivation and a market for his products, and he will grow anything you want and in any manner you want. But give him any advice, however wholesome, which has no immediate monetary value, tell him not to burn cow-dung as fuel, to grow fodder crops for his cattle, to weed out his scrub cattle, repair his tank regularly every year, and so on, you will make little headway. Our ryot is an opportunist, and if you wish to improve his methods quickly, you must work on the lines of least resistance.

From investigations recently made, the cultivation of tobacco of the Virginia and other modern varieties seems to offer possibilities of development on lines similar to those which have been adopted with success for sugarcane. I trust that this will afford us one more illustration of the combined methods of cultivation and marketing which we should adopt if we are to take the Mysore ryot along the easy road to prosperity which naturally appeals to him.

But you, Members of the Union, realise that for such short-cuts to success, the scope is limited. Agriculture is a hard mistress and demands patient toil. You can only benefit by the necessarily slow accumulation of experiences gained in the laboratory and in the field, proceeding from strength to strength. But your victories, hard won though they might be, will be abiding in character and will in the long run benefit large sections of the community to whom it is impossible to offer the inducements of immediate profit.




PLAN SHOWING THE LOCATION
OF
THE PADDY BREEDING STATION
NAGENAHALLI

# Paddy Breeding Station, Nagenahalli

BY

**S. V. Sharma**

*Junior Assistant Botanist*

The Paddy Breeding Station, Nagenahalli, is the central station for paddy breeding work in the Mysore State. It is under the direct control of the Deputy Director of Agriculture, Dr. V. K. Badami. This Station is mainly intended to serve the area under the Cauvery Channels, the Malnad varieties being studied at Marthur Farm in Sagar Taluk, and the summer varieties at Hebbal Farm near Bangalore. The Breeding Station is situated near Nagenahalli, five miles from Mysore on the Mysore-Bangalore Road. It is about 63 acres in extent out of which about 42 acres are under actual cultivation, the rest being taken up by buildings, roads, bunds, waste lands, etc. A rough plan of the station showing details is given in the accompanying Plate.

A single crop of paddy is raised every year during the season from June to January. The plots are irrigated from the Right Bank Low Level Channel of Krishnarajasagara. The water from a well is being made use of for raising the early nurseries.

The Farm is situated on an elevated mound. The top dry area locates the Farm buildings and laboratories. The fields slope down in all directions and the gradient is especially steep to the south. The soil varies from poor shallow gravelly type to deep red clay. Red loam occurs in some ranges. This varying nature of the soil and the contour are typical of the area served by the Right Bank Low Level Channel.

This Station was opened in the year 1917 as a demonstration farm for conducting paddy and sugarcane, varietal, cultural and other experiments.

Valuable information in regard to these crops were collected up to the year 1929, when the Farm was converted into the Central Paddy Breeding Station. Its chief work was to

meet all the problems connected with paddy plant and its cultivation. Varietal tests, selection and breeding work were taken up to evolve superior strains.

The seasonal conditions of this place are typical of the Cauvery area stretching from Ramanathapur to Talakad. The following rainfall table for the year 1932 is fairly representative of the conditions prevailing in the Cauvery Valley :—

| Month | Amount of Rainfall in inches | No. of Rainy days | Details of Rainy days | | | |
|---|---|---|---|---|---|---|
| | | | Less than ½" | ½" to 1" | 1" to 2" | More than 2" |
| April | 1·47 | 3 | 2 | — | 1 | — |
| May | 6·76 | 11 | 7 | 2 | 1 | 1 |
| June | 0·68 | 4 | 4 | — | — | — |
| July | 1·72 | 12 | 12 | — | — | — |
| August | 6·10 | 10 | 6 | 1 | 2 | 1 |
| September | 0·57 | 4 | 4 | — | — | — |
| October | 7·89 | 16 | 10 | 4 | 1 | 1 |
| November | 4·35 | 9 | 5 | 2 | 2 | — |
| December | — | — | — | — | — | — |
| Total | 29·54 | 69 | 50 | 9 | 7 | 3 |

Summer supply of water is allowed in the old channels to enable the cultivators to raise successful green manure crops, which are usually sown in March-April. Lands under the new channels have to depend entirely on timely rains in those months for sowing seeds for green manures. If the rains fail during that period and the sowings are delayed, there is always a heavy infestation of moths on sunnhemp later on, and the green manure is invariably a failure. In these gravelly open poor soils, organic matter is quite essential for raising heavy crops of paddy. Water is generally allowed in the channels by about the 10th of June and conti-

nued to run for seven months till the 10th of January every year. Paddy is generally sown in seed-beds between June 15th and July 15th. The fields are prepared, puddled and made ready for transplantation from about the third week of July to the end of August.

## Green Manures

During successful years the following green manures have been tried:—Sunnhemp, Groundnut, Horsegram, Velvet Beans, Cowpea, Soy Beans, Greengram, Honge Leaves and Blackgram. Of these Sunnhemp, Cowpea, Velvet Beans and Soy Beans seem to be well suited to the locality under favourable conditions.

Various manurial experiments are now under observation and they are under the direct supervision of the Agricultural Chemist. It is attempted to find out the requirements by soil of Nitrogen, Phosphoric Acid, and Potash. In addition it is attempted to fix the theoretical and economical doses of complete manures for raising maximum crops. The general standard of manures now applied is 4,000 lbs. of green manure, 80 lbs. of Ammonium Sulphate and 168 lbs. of Super. It may be observed in passing that unless the soils are very poor and exhausted, applications of artificial manures in heavy doses is not paying in these days of low prices. It is too early to properly evaluate the effects of various manures and therefore the discussion on these experiments is postponed for the present.

*Spacing Experiments* were conducted on this Station for three years with G.E.B. 24 paddy which has now become the bulk crop in this locality. Planting 6 to 9 inches apart seems to be most economical under the Station conditions. The results for the three years 1929–30 to 1931–32 are given below:—

| | 1929–30 | | 1930–31 | | 1931–32 | | Average of 3 years | |
|---|---|---|---|---|---|---|---|---|
| | Average of 4 plots | | Average of 3 plots | | Average of 3 plots | | | |
| | Grain | Straw | Grain | Straw | Grain | Straw | Grain | Straw |
| Very close planting .. .. | 2,190 ± 543 | 2,849 ± 76 | 3,642 ± 614 | 6,358 ± 848 | 2,581 ± 217 | 4,029 ± 338 | 2,806 ± 458 | 4,412 ± 649 |
| 6″ apart on either way .. | 2,536 ± 208 | 2,798 ± 224 | 3,722 ± 599 | 5,406 ± 1393 | 2,402 ± 145 | 2,952 ± 257 | 2,887 ± 317 | 3,719 ± 611 |
| 9″ apart on either way .. | 2,458 ± 196 | 2,606 ± 119 | 2,968 ± 520 | 5,561 ± 788 | 2,383 ± 237 | 2,581 ± 307 | 2,836 ± 318 | 3,583 ± 485 |
| 12″ apart on either way .. | 2,169 ± 168 | 2,298 ± 237 | 3,476 ± 162 | 4,732 ± 257 | 2,047 ± 128 | 2,436 ± 95 | 2,564 ± 153 | 3,155 ± 196 |
| 6″ apart in 9″ rows .. .. | 2,468 ± 126 | 2,650 ± 71 | 3,481 ± 407 | 4,741 ± 535 | 2,176 ± 244 | 2,796 ± 264 | 2,708 ± 258 | 3,396 ± 290 |
| 6″ apart in 12″ rows .. .. | 2,274 ± 324 | 2,362 ± 359 | 3 508 ± 251 | 4,835 ± 599 | 1,931 ± 168 | 2,435 ± 490 | 2,571 ± 248 | 3,211 ± 482 |

## Varietal Trials

There are now over 200 varieties under observation. The following classification of the most important ones gives their duration, quality and yielding capacity. The age of seedlings at the time of planting is usually thirty days.

### *I. Very early varieties ripening in 80 to 100 days after transplantation.*

| Variety | Yield of grain per acre in lbs. | ± st Devation | Straw per acre in lbs. |
|---|---|---|---|
| *Coarse.*— | | | |
| 1. Hebbal two months .. .. | 1,902 | 100 | 3,695 |
| 2. T. 2040 .. .. .. .. | 1,350 | 441 | 2,522 |
| 3. Aduthoria 4 .. .. .. | 1,725 | 231 | 3,269 |
| 4. Do. 3 .. .. .. | 1,680 | 131 | 3,632 |
| 5. Giddabyra .. .. .. | 1,320 | 386 | 3,275 |
| *Fine.*— | | | |
| 6. Bangar Kaddi .. .. .. | 1,589 | 78 | 4,006 |

### *II. Early varieties ripening in 100 to 115 days after transplantation.*

| Variety | Yield of grain per acre in lbs. | ± st Devation | Straw per acre in lbs. |
|---|---|---|---|
| *Coarse.*— | | | |
| 1. Hassan Doddi .. .. .. | 1,769 | 374 | 2 593 |
| 2. Bidanur sanna .. .. .. | 1,309 | 273 | 2,224 |
| 3. Gabah Tongson (Java) .. .. | 1,988 | 420 | 2,859 |
| 4. Kavade Doddi .. .. .. | 1,368 | 215 | 2,246 |
| 5. Chandragutti .. .. .. | 1,518 | 391 | 2,493 |
| 6. Paddy No. 3 .. .. .. | 1,592 | 519 | 2,706 |
| 7. Halubbalu .. .. .. | 1,675 | 467 | 3,469 |
| 8. Kangadale .. .. .. | 1,001 | 269 | 1,334 |
| *Fine.*— | | | |
| 9. Small grained .. .. .. | 1.486 | 447 | 2,492 |
| 10. Chintamani sanna .. .. .. | 1,004 | 160 | 2 101 |
| 11. P. S. 49 .. .. .. .. | 1,234 | 267 | 2,333 |
| 12. Basumathi .. .. .. | 1,550 | 276 | 2,246 |
| 13. Kempuraja .. .. .. | 1,129 | 177 | 2,253 |
| 14. Bangarthiga .. .. .. | 1,110 | 222 | 2,783 |
| 15. P. S. 50 .. .. .. .. | 1,035 | 628 | 1,720 |
| 16. New Sanna .. .. .. | 1,418 | 142 | 2,424 |
| 17. Vizayanagaram paddy .. .. | 1,485 | 279 | 2,933 |

*III. Medium varieties ripening in 110 to 120 days after transplantation.*

| Variety | Yield of grain per acre in lbs. | ± st Devation | Straw per acre in lbs. |
|---|---|---|---|
| *Coarse.*— | | | |
| 1. T. 2030 .. .. .. .. | 1,631 | 85 | 2,296 |
| 2. Gabah Scrimankoti (Java) .. .. | 2,634 | 301 | 3,641 |
| 3. Hasadi .. .. .. .. | 966 | 226 | 2,601 |
| 4. Madhuri Paddy .. .. .. | 1,259 | 118 | 2,663 |
| *Fine.*— | | | |
| 5. Natanahalli sanna .. .. .. | 1,427 | 301 | 3,545 |
| 6. Alur sanna .. .. .. | 1,282 | 167 | 2,994 |
| 7. Garike sanna .. .. .. | 1,260 | 304 | 4,067 |
| 8. Banku .. .. .. .. | 1,215 | 107 | 2,546 |
| 9. Pitchodi .. .. .. .. | 1,215 | 379 | 2,570 |
| 10. Kolamba 42 .. .. .. | 1,158 | 128 | 2,946 |
| 11. Black scented .. .. .. | 728 | 100 | 2,455 |

*IV. Late varieties ripening in 120 to 130 days after transplantation.*

| Variety | Yield of grain per acre in lbs. | ± st Devation | Straw per acre in lbs. |
|---|---|---|---|
| *Coarse.*— | | | |
| 1. Chamba .. .. .. .. | 1,420 | 108 | 3,496 |
| 2. Chamba sanna .. .. .. | 1,431 | 278 | 3,010 |
| 3. Dusi sanna .. .. .. | 1,447 | 116 | 2,853 |
| 4. Gabah Tijina (Java) .. .. | 1,862 | 128 | 5,330 |
| 5. Bilibhatta .. .. .. | 1,841 | 362 | 5,258 |
| 6. Gabah Tewas (Java) .. .. | 1,684 | 264 | 3,829 |
| 7. Gabah Sirosaki (Java) .. .. | 1,260 | 197 | 3,704 |
| 8. Doddabyra .. .. .. | 1,023 | 379 | 2,260 |
| *Fine.*— | | | |
| 9. Maharajabhoga .. .. .. | 1,662 | 337 | 3,252 |
| 10. G. E. B. 24 .. .. .. | 1,582 | 432 | 3,160 |
| 11. Byhunda .. .. .. .. | 1,969 | 141 | 3,445 |
| 12. Delhi Prayag .. .. .. | 1,620 | 223 | 2,517 |
| 13. Balaramabhoga .. .. .. | 1,429 | 234 | 3,422 |
| 14. Kichadi samba .. .. .. | 1,447 | 476 | 2,587 |
| 15. Ratna choodi .. .. .. | 2,084 | 425 | 3,573 |

*V. Very late varieties ripening after 130 days after transplantation.*

| Variety | Yield of grain per acre in lbs. | ± st Devation | Straw per acre in lbs. |
|---|---|---|---|
| *Medium varieties.*— | | | |
| 1. Kembuthi .. .. .. | 2,132 | 554 | 3,915 |
| 2. Pattasomanahalli .. .. .. | 1,445 | 255 | 3,911 |
| 3. Kaddi .. .. .. .. | 1,811 | 184 | 3,587 |
| 4. Rangoon red .. .. .. | 1,231 | 337 | 3,295 |
| 5. Rangoon white .. .. .. | 1,340 | 110 | 3,131 |
| *Fine.*— | | | |
| 6. Nagpur sanna .. .. .. | 1,711 | 340 | 2,807 |

## Plant Selections

The collections received on the Station were found to be mixtures of many types. The first year was devoted to the purification of the varieties to start a foundation stock for further work. In addition, selections in Kaddi, Pattasomanahalli sanna and Kembuthi were made on a large scale in the ryots' fields. Selections were also made from the purified varieties in succeeding years. Uptil now over 700 such plant selections have been tested, out of nearly 2,500 plants selected in the fields. These plant selections were tested in rows in the first instance and the promising ones were removed to plot trials in later years.

As a result of these tests the following strains were isolated. The outstanding ones were multiplied and given out for preliminary trials. The satisfactory ones were then released for distribution. The popular ones now are the following:—

1. S. 67 Kembuthi.
2. S. 139 Kaddi.
3. S. 363 Pattasomanahalli.
4. S. 246 Nagpur fine.
5. S. 236 Nagpur fine.

S. 139 (*Kaddi*) is a very prolific type growing to a height of about 4 to 5 feet. It is a free tillerer also. The straw is light and coarse. The grain also is coarse. This type lodges badly, but does not seem to shed if harvested in time. It

takes about 6 to 6½ months to mature from the date of sowing, and is not well suited to rich soils as it is likely to put forth heavy vegetative growth. But it is highly suited for poor and gravelly soils where a large amount of valuable straw is produced for which purpose it is popular in the locality.

S. 67 (*Sanna kembuthi*) is a red-glumed type, with medium grain and white rice. It is finer than Kaddi and grows to a height of 4 to 5 feet, but matures at about the same time as Kaddi. Owing to tall growth, it lodges badly.

S. 246 (*Nagpur fine*) is a very fine type growing to a height of 3½ to 4½ feet, maturing within 5½ months from the date of sowing, having a straw which is finer than that of Kaddi or Kembuthi and is much relished by cattle. The grain is slightly longer but thinner than that of G.E.B. 24, slightly curved and straw coloured. This rice fetches a higher price than G.E.B. 24 on the market.

S. 363 is one of the new strains selected from the Pattasomanahalli sanna variety which was once considered the best paddy in Mysore. It is also late maturing like Kaddi and Kembuthi, and resembling them in growth, straw and habit. Straw is slightly golden yellow in colour and the grain is red-glumed but not so fine as that of S. 246.

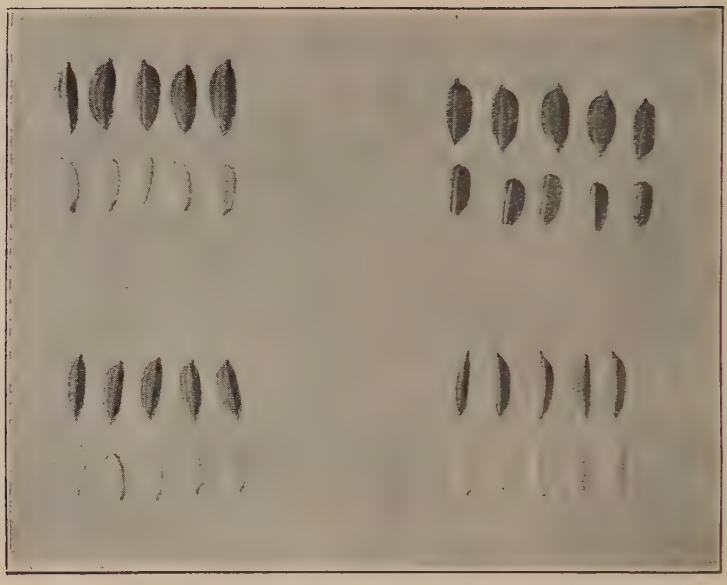
It is gratifying to note some of the selections, especially S. 246, becoming more and more popular in the area and of this, during this year in one village, Kurubarasettihalli, Seringapatam Taluk, more than 100 candies of seed are said to have been distributed for sowing by two ryots who had taken the seed from us last year. It is also said that the paddy was sold at Rs. 12 a candy when the ruling price for G.E.B. 24 was only Rs. 8, which shows that the people in the locality greatly appreciate the quality of this rice.

## Hybridization Work.

Although G.E.B. 24 is considered to be a good strain fetching more money for the ryots and good profit for the mill-owners than the original Kaddi, which it has replaced

Plot of G. E. B. 24 Paddy.

Plot of Manurial Experiments, G. E. B. 24 Paddy.



Paddy and Rice of

*Kaddi*
G. E. B. 24.

*Kembuthi*
S. 246.

Testing Cooking qualities of Rices.

in this area, yet it has some drawbacks. Being a heavy yielder it requires rich soil or good manuring for growth. In poor soils the yield is not considered to be as good as Pattasomanahalli, Kaddi and other varieties which are more vigorous than G.E.B. 24. Secondly, the yield of straw is very much less than that of Kaddi and the ryots experience shortage in the yield of fodder when they grow G.E.B. 24. The straw, although it is thin, is stiff and there is a popular opinion that it causes griping and dysentery in animals. In this area, the question of fodder is a very important one and with the extension of area under G.E.B. 24 the shortage of straw has become very pronounced. So a demand has arisen for a strain that will give good yield, both of grain and straw.

The problem on this station now is to synthesize new varieties of paddy plants from out of the pure foundation stock now available. Attempts have been made now to combine the desirable qualities by means of hybridization. So far the results have been quite encouraging. Intensive work in this direction will have to be carried on hereafter.

### Seed Distribution

Pure seed of G.E.B. 24 has been distributed from this Station during the last 5 years to the extent of 1,46,804 seers. It is arranged now to multiply pedigree seeds for general distribution on the Irwin Canal Farm as the area on this station is limited.

In regard to the study of milling qualities of rice, critical observations are being made. G.E.B. 24 gives nearly 52 to 54 per cent. by volume of rice against 45 to 48 per cent. of Kaddi and 43 to 46 per cent. of Nagpur fine. Many selections have now been made for higher percentage of rice. The general market for coarse rice of the Cauvery Valley is outside the State in Bombay Presidency and these paddies are chiefly used in preparation of pop corn and puffed rice. The fine rices are said to be quite unsuited for such purposes. That the extinction of these coarse types might lead to the loss of important markets should always be borne in mind in the

extension of newer types. Arrangements are now being made to study and classify the various rices as to their utility in the preparation of popped rice, puffed rice and beaten rice.

The cooking qualities of the various rices have been studied to some extent and demonstrated in the exhibitions at Mysore on various occasions and they usually attracted big crowds of people. In regard to the testing of the quality of Mysore rices the University of Mysore is co-operating with the Department of Agriculture during the last three years.

The months of October and November are the best time to visit the Station for inspecting the plots and studying the various experiments. There is a guest room and a kitchen fully equipped. Every facility will be given to visitors during their stay on the Station.

---

## Sheep-Pox

BY

**G. N. Srikantaiah, G.M.V.C.**

It is believed that Sheep-pox originated in Central America and that it spread from there to other countries.

This Pox is specific to sheep. Small-pox in man is of the same nature. Sheep-pox is not communicable to goats but there are some instances where sheep-pox was transmitted to goats in contact with the sheep. Man and other animals are immune from this disease.

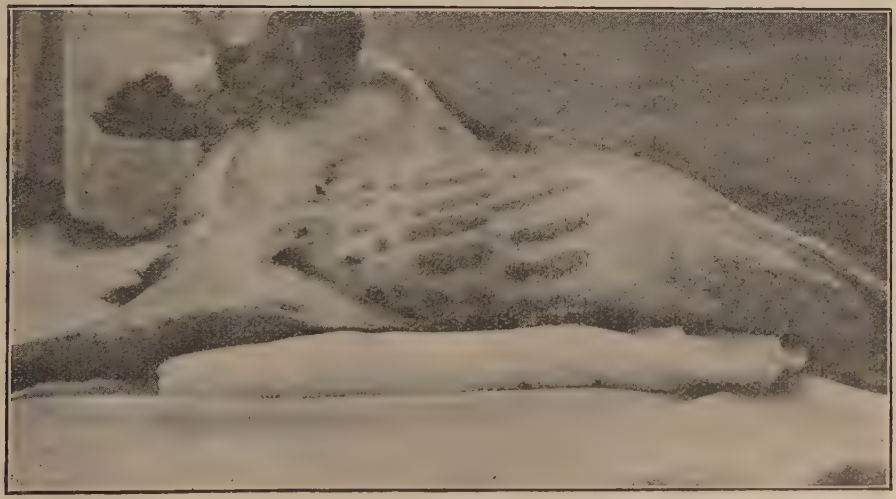
Pox in sheep is highly infectious. Among the infected animals, a mortality of 90 per cent. occurs. The disease takes a virulent form during summer months.

### Spread of the Disease

The causative agent of sheep-pox is the "Virus" which is contained in the vesicles and nodules of pox and in the discharges. According to some authors blood is also infective in the earlier stages before the cutaneous lesions appear.

There are instances of the virus being carried through the medium of air, to a distance of 500 yards, and infecting

Natural infection of Sheep-Pox in Goat.



Artificial infection of Sheep-Pox for the preparation of Vaccine.

healthy sheep. Shepherds' clothes contaminated as they are by the virus excreta and discharges of the affected animals may act as very good agents for the spread of the disease. The part played by watch dogs, etc., in the spread of this disease is no less. The dried scabs that peel off during the healing stage contain the virus and are highly infectious. The dry peeled off scabs become disintegrated and mix in the air. When such air is inhaled by sheep, the virus enters the lungs whence it is absorbed into the blood and carried over the body. The poison thus entering the body shows itself up in the form of lesions on the skin.

### Symptoms

For the appearance of the first symptoms of the disease, it takes one to three weeks after infection. The infected one looks dull, suffers from high fever and prefers a solitary and secluded place. Cessation of rumination, loss of appetite, heavy breathing and shivering of the body are noticed. After three or four days red spots of extravasation of blood due to rupture of the capillaries are seen on the skin of the abdomen, on the underside of thighs and shoulders where the hair is scanty. Eye and nasal discharges and salivation are prominent. Day by day each hæmorrhagic spot spreads developing into a stage when the bottom of it becomes hard and the top soft and flat with a depression in the centre. In 8 or 10 days the lymph will have collected in the vesicles. One after another these vesicles burst open discharging the lymphs and scabs are formed. In a few days the scabs thus formed become dry and drop off. Many a time the vesicles join together when the disease takes a serious turn. The disease is very dangerous when the lungs and digestive tract are affected.

### Treatment

The affected sheep should be kept in a dry, cool and shady place but should not be exposed to rain or burning sun. The best remedy is the application of an ointment prepared by mixing thoroughly one tola of turmeric (*Curcuma*

*longa*) powder with one pound of paste of green neem leaves (*Melia azadirachta*). Continued application of this ointment till the wounds are healed is necessary not only for healing purposes but also to repel flies effectively. Large quantities of clean fresh water should be given for drinking. Green grass, radish, cabbage, etc., cut into small slices would be very suitable for food. Gruel made out of ragi (*Eleusine coracana*) or rice, form part of a good diet.

### Prophylactic Measures

All the animals affected in a herd should be isolated. Pastures where the sheep used to graze should be abandoned temporarily and the neighbouring villagers should be warned not to allow their sheep to the infected pastures. Many times, when an outbreak occurs in a herd, flock-owners commit the mistake of driving their sheep that lived in contact with the affected ones to weekly shandies for sale so as to escape from the heavy loss that might be caused. There is the danger of spreading the disease to many villages by doing so. It is necessary, therefore, to put a stop to such practice in the interest of the public.

### Vaccination

The only method known to prevent the disease is vaccinating the animals and immunising them against the disease. The required vaccine is being prepared in the Mysore Serum Institute, Bangalore. This vaccine has been tried on several thousands of sheep in the State by the Civil Veterinary Department and the results have been very good.

---

## Is Food Grown with Commercial Fertilizers Not Good for Health ?

In recent years it has been frequently maintained that applications of commercial fertilizers not only impaired the quality of food crops but also made their consumption danger-

ous to health. In order to investigate this question nutritional experiments on rats were carried out under the auspices of the University of Leipzig over a long period. Rats are particularly suited to such investigations because they grow quickly, are omnivorous in habit and having been associated with man since prehistoric times, can live on prepared food.. In this experiment, which was carried on for two and a half years, it was possible to observe the effect of the nutritional treatment on the original animals throughout their life cycle and also on the development of seven generations. The experimental ration consisted of grain, vegetables, meat and milk. The grain and vegetables were procured from two groups of farms, those on which commercial fertilizers had been used for years. The meat and milk came from animals which had been fed on fodder grown with and without fertilizers.

The results of the investigations which are reported in *Die Ernahrung der Pflanze* for January 1935, are summarised as follows:—

These experiments show that the rats fed on food grown with commercial fertilizers were superior in respect to length of life, prolificacy, and average number of young produced to those fed on food grown without fertilizers. In both cases, no differences were observed with regard to growth and general development.

Not only was the health of the animals not impaired in any way but, on the contrary, there were indications that food grown with fertilizers has a definitely beneficial effect on the vitality of the animals in question.

N. V.

## SELECTIONS

### The Average Butter Fat of the Milk of Various Dairy Animals

The average butter fat test of the milk of various dairy animals are as follows:—Philippine carabao, 10.17 per cent.; Indian buffalo, 7.31 per cent.; Philippine cow, 3.90 per cent.; Indian Nellore cow, 2.90 per cent.; Red Scindi cow, 2.80 per cent.; Holstein cow, 2.73 per cent.; doe, 4.50 per cent.

—*The Philippine Agriculturist,* Vol. XXIII, No. 7.

### Paper Etc. from Bagasse

Negotiations for the establishment of a large paper factory for making paper from bagasse and wattle wood pulp, on the banks of the Umgeni, are proceeding steadily, and it is expected the site will soon be occupied. Steps are also being taken to commence a factory for making building board from bagasse. The Natal Estates have been working on the project for a long while.

—*The South African Sugar Journal,* Vol. 19, No. 2.

### A Ginger Manurial Experiment

BY

**A. W. R. Joachim and H. A. Pieris**

Manurial experiments were undertaken to determine whether the yields of ginger could be improved. The experimental plot was situated at Siyambalagoda near Peradeniya, and was one-thirtieth acre in extent, of ferruginous, gravelly loam lacking in organic matter and slightly acid in reaction. The lay-out and treatment are described. The results were statistically examined and the following conclusions drawn:—Sulphate of potash gave 40 per cent. increase, and a complete fertilizer gave 80 per cent. increase, the odds being 20 to 1 and 100 to 1 respectively against those differences being due to chance. Nitrate of soda and superphosphate gave no significant results.—(*Imperial Agricultural Bureau, Hort. Abs.,* Vol. III, No. 3, Ab. 403.)

—*Tropical Agriculture,* Vol. XI, No. 1.

### Irrigation of Rice Fields in the Tropics

*Optimum Height of Water.*—At the time of transplanting 1½″ to 2″ of water is maintained to encourage the plants to take root and

to reduce damages by crabs and the same level is maintained for 4 or 5 days subsequently. Then it is gradually raised to 4" till about the beginning of tillering. Good growth and tillering are encouraged by draining the water in the field 10 to 15 days after the crop has established and reducing the level to 1½" to 2". It has been found that tillers do not develop if the plant is too deeply submerged. After tillers have been established the level of water may gradually be increased upto 5" to 7" and the greater depth of water at the time of flowering and grain setting has been found to be beneficial to higher yield. The field can be drained and a lower level of water may be maintained after the grains are well developed. Complete draining and hardening the soil should not be done if paddy crop is again to succeed after a short interval. The high yields obtained in Italy are mainly attributed to a steady admission of fresh water by a slight current and draining the land completely 2 or 3 times for several days during the period of growth.

—*The Madras Agricultural Journal*, Vol. XXIII, No. 3.

---

**How to Deal with Nut Grass**

Nut Grass is a perennial with a creeping root stock which forms, here and there, small dark-coloured tubers. The stems are slender and triangular towards the top, and the leaves are numerous, glossy-green, narrow with the mid-vein prominent on the under-side. The spikelets are reddish-brown and arranged in short spikes or clusters on unequal stems. The pest spreads rapidly by means of the scaly, fibrous root stocks, which produce tubers in great abundance, from which shoots are sent to the surface.

Repeated hoeing or frequent use of the cultivator throughout the season, wherever it is possible to use these implements, or digging out with a hand-fork taking care to lift out the tubers attached to the roots, are the best methods of controlling nut grass. It is also possible to diminish the pest by smothering it with sod-forming grasses, or by the growing of lucerne, clover, or plants such as New Zealand spinach, cowpea, rice, bean, horse gram, kidzu, and velvet beans.

On low lands adjacent to creeks or rivers, badly infested areas may be inundated with water for a few weeks when the plants are in full growth, and it will be found that the plants will perish and the underground tubers will rot. On small areas, tan-bark, fresh stable manure, and similar substances will materially assist in preventing the growth and formation of tubers. Another method is to plough, and to turn pigs on to the loosened soil to eat the tubers.

—*The Agricultural Gazette of New South Wales*, Vol. XLV, part 7.

## The Age Factor in Farming

Perhaps one of the most arresting statements in the Agricultural Research Council's recently-issued report relates to the influence of the age factor in farming success. Thus it is suggested that the oft-held view that farming success depends on an agricultural ancestry and the handing-on of family knowledge from one generation to another is erroneous. Support is given to this contention by the survey of East Anglican Farming undertaken by the Economic Branch of the Cambridge University School of Agriculture in 1932. It appeared from this that, of farmers occupying holdings of over 1,000 acres, an inverse correlation existed between age and success, measured by farming profits. The lower the age group, the higher the profits.

It used to be held that success in farming was largely dependent upon the capacity for sustained hard work. The individual with considerable reserves of energy united with a degree of enthusiasm for his job could break down many of the barriers to farming prosperity by these qualities alone. That there must be a full knowledge of the fundamentals of farming practice goes without saying, but something more is needed in these days, and especially the capacity for looking ahead and the ability to apply the knowledge that results from the researches of scientists and others. Flexibility in farming outlook is a very desirable quality to cultivate—an open mind, with the capacity to sift evidence of economic value and to apply it to one's own conditions. It is sometimes possible that enthusiasm for hard work on the part of the farmer is in itself responsible for the limitation of farming profits. This is especially so where there is labour to control and which demands adequate supervision. Farming is becoming more and more of a business, with the need for men who are versed in business methods, and it is from this angle in particular that farming operations and practices must be studied. On this basis tradition and sentiment are largely eliminated, and the key question is one of how to make farming pay. This is a matter that demands time for hard thinking—and, one may add, time for discriminating reading.—*The Journal of the Ministry of Agriculture*, Vol. XLI, No. 10, Jan. 1935.

---

## Electrical Developments in Russia

On January 10th last, before the Institute of Electrical Engineers in London, Mr. Alan Monkhouse read a paper entitled "Electrical Developments in U.S.S.R.". The crowded assembly of members listened to an impressive description of how an apparently backward country, faced with many difficulties, had created a gigantic electrical scheme within its vast territories as a first essential to their development.

The Russians, he pointed out, have departed from many existing ideas and did not hesitate to adopt the very latest practices, and in many instances have gone ahead with entirely new schemes to suit their geographical and industrial situation. From an array of imposing statistics it is of interest to note that from 1923 onwards, the construction of more than 56 large electric power stations and the building of more than 8,000 miles of 110,000 to 220,000 volt overhead lines with their distribution sub-stations has been undertaken.

The peat areas of Russia constitute 42 per cent. of the world's peat resources and by careful research work its use has been applied on a large scale to the generation of electricity.

Shatura, a station of 136,000 k.w., Govgres and Dulrovka each 200,000 k.w., are amongst others totalling a 1,000,000 k.w. of power stations which rely upon peat for their fuel.

The peat has a moisture content of approximately 40 per cent. and burnt upon a grate which is described as a combination of a chain grate and a gas producer.

Another interesting feature is the extensive development of the thermal electric power stations, and large areas of Moscow and Leningrad are heated by this method. It is estimated that 850,000 k.w. of such plant is installed and more at present being erected.

Many of the large new industrial towns are being built with the intention of heating all their buildings in this way, in addition to supplying power and process steam to the industries themselves.

The result is that 40 per cent. of their power stations are working on low-grade fuel with steam conditions generally higher than those of Britain, and owing to careful planning the Russians express satisfaction at the high station efficiencies obtained.

It will come as a surprise to many to hear the view expressed that Russia is rapidly taking a leading position amongst the industrial countries of the world. This paper by an eminent Engineer, who has spent over 20 years in Russia, certainly impartially chronicles a remarkable achievement.

—*The South African Sugar Journal,* Vol. 19, No. 2.

---

## Budding and Grafting Trials with Cotton & Related Plants

BY

**S. C. Harland**

This short paper describes budding and grafting trials between widely different species of Gossypium, and also between the genera Gossypium, Thurberia, Paritium, Hibiscus, Thespesia, and Erioxylum. The literature is briefly referred to though there seems a slight reluc-

tance to deal with the subject historically. For instance, since Smith (1909) working in Hawaii was the first to demonstrate the practicability of budding cottons it seems a little unnecessary to quote unpolished later observations by other workers merely going over the same ground.

It may be mentioned that cotton was successfully grafted as early as 1871, for in the *Gardener's Chronicle* for that year, p. 1260, is a figure of a grafted seedling, the scion being united to the stock just below the cotyledons.

Beckett found that *G. Sturtii* could be successfully budded on to *G. Davidsonii* and *G. arboreum*, and inarched with upland types of cotton from lower California and Siam. *Thurberia thespesioides* was budded on *G. arboreum* and *G. calycotum*, while *Erioxylum aridum* was budded on to *G. arboreum*. These results are all consistent with our knowledge of the taxonomy of the genus Gossypium, since on both cytological and genetical grounds it is the consensus of opinion at this Station that both *Erioxylum aridum* and *Thurberia thespesioides* are members of the genus Gossypium.

It may be mentioned that the practice of budding or grafting species of Gossypium on other species has been in common use at this Station since 1926 and although a few combinations have not been tried there is little doubt that all species of Gossypium intergraft with the greatest of ease.

Of greater interest is Beckett's pronouncement that *Paritium tiliaceum* (*Hibiscus tiliaceus*) and *Thespesia populnea* can be successfully inarched with Gossypium and also upon each other. Between 1926 and 1930 the intergrafting relationships of Gossypium to other genera in the Hibisceæ were studied by the writer, but although a loose union was obtained between Thespesia and Gossypium, there was no evidence of any transference of nutrients from stock to scion. The scion could persist for several weeks in a green state but failed to make independent growth, when all branches were removed from the stock.

A photograph is presented in Beckett's paper of a plant of *G. Sturtii* carrying an inarched branch of *Thespesia populnea*, but the plant still has a branch of the stock *G. Sturtii*.

In considering the type of union between stock and scion all stages seem to be possible between a loose association of cells which permits water to pass from stock to scion but not nutrients necessary for growth, and a real biochemical union permitting normal growth and translocation of nutrients. In the opinion of the reviewer the term successful grafting should be confined to the latter type of union and if this delimitation be accepted, the question of whether success has been attained in grafting Gossypium with Thespesia or Paritium must be left open.

—*Tropical Agriculture.*

## Exceptional Yields of Wheat

BY

**Prof. Georges Ray**

The question of yield in the production of wheat is one of fundamental importance so much so that the criterion of quality only enters into commercial transactions in an empiric manner and as a question of secondary importance. It is, therefore, natural that heavy yields are sought after under all circumstances and in all places. The systematic pursuit of high yields is not after all fatally anti-economic as has often been maintained, because it is perfectly logical to try and obtain a determined quantity of wheat on the smallest area of soil possible. One may even say that the chances of success in obtaining exceptional yields are greater in small cultivations than in large.

Practice has proved this many times and especially in Italy last year. During the particularly successful campaign of the "Battaglia del Grano", the efforts of the competitors have attained surprising results, especially in Northern Italy where the yields have constituted veritable records; 65 quintals to the hectare (Brescia), 68 (Aosta), 71 (Cremona), 72 (Vercelli-Turin), 82 (Parma).

Although officially verified, these yields seemed extraordinary and several agriculturists have asked for information on the methods of cultivation followed by Italian agriculturists which have resulted in obtaining exceptionally abundant harvests of wheat. Details have been given on this subject in many agricultural periodicals which have appeared in Italy in 1934, but an enquiry on the spot seemed to me indispensable to complete the information obtained and to determine an important point in the evolution of the cultivation of wheat. The Ministry of Communications, thanks to the intervention of the distinguished Vice-Director of the E.N.I.T., Avv. A. Rava, having accorded me important facilities for travel, I was able to traverse the region of Parma in all directions from 13 to 15 June of this year, under the competent guidance of Prof. G. Savazzini, Director of the Travelling Chair of Agriculture of Parma.

At this time the harvest was at its height, the wheat having ripened 8 to 10 days earlier than in normal years, thus terminating a series of adversities (persistent rain at the time of sowing, hard frosts in winter, heavy rains in March and April, great heat in May) which had handicapped considerably the cultivation and given an exceptional character to the season of 1933–34. In spite of that, the appearance of the fields at harvest time was in general very good and the cleanliness and regularity remarkable. These results of a cultivation considerably handicapped by meteorological conditions are, in my opinion, even more worthy of attention than those obtained last year which was a

very favourable year. In fact, they are proof of the preponderant part played by human genius in the perfectioning of an essential form of cultivation.

The high yields obtained in the district of Parma are due to the application, by cultivators of remarkable ability, of the following principles:—

1. The use of a very small number of chosen varieties capable of taking heavy manures. (*Damiano Chiesa, Mentana, Villa Glori*). In 1934 *Damiano Chiesa* was so outstanding as to be in many places the only variety of wheat grown.

2. The application, on land having been deeply worked and perfectly drained, of a very heavy dressing before sowing of, for example, 150 kg. of sulphate of ammonia or of cyanamide, 200 kg. of sulphate of potash and 1200 kg. of superphosphate, to the hectare.

3. Sowing in lines, late (last week in October) and thick (200 to 240 kg. of seed to the hectare), to assure a very high density, without tillering (500 to 600 heads to the square metre).

4. A supplementary nitrogenous dressing applied periodically from December to March (200 to 400 kg. of nitrate to the hectare).

5. The example given by the agriculturists of Parma for determination of a method of wheat growing essentially original is highly instructive. It is already very interesting that a wheat production record should have been obtained in a period of agricultural crisis. It is none the less important to realise how, in consequence of the great progress made in a few years in the cultivation of wheat, thanks to the combined efforts of Italian geneticists and agriculturists, it is possible to reduce the area given up to wheat growing on scientifically-managed farms.

—*International Review of Agriculture*, Vol. XXV, No. 8.

---

## COTTON

### Characters of a Superior Variety

BY

**C. B. Doyle, *Bureau of Plant Industry***

From the standpoint of the cotton growers, the characters of a superior variety of cotton are early maturity; medium to light foliage; large, storm-proof bolls, many with five locks and easy to pick; large yield per acre; high lint percentage; and abundance of fiber of good length, strength, and uniformity, on large heavy seeds that germinate well.

* * *

Small-bolled varieties may begin blooming and setting fruit a few days earlier than the big-bolled cottons, but early varieties with big bolls that frequently set more fruit during the first 40 days of the fruiting period than the small-bolled cottons, have been developed. . . . Also big-bolled varieties usually continue fruiting over a longer period than do the small-bolled cottons, which is also an advantage, because the weevils are attracted away from the growing bolls to the tender squares.

Most cotton varieties with small bolls appear in the field to be more productive than varieties with large bolls. This is due largely to the fact that most of the small-bolled varieties have short fiber. The bolls frequently open more widely and allow the cotton to fluff out from the locks. On account of their thinner walls, the small bolls dry out more quickly and usually open several days sooner than the thicker-walled bolls of the big-bolled varieties, though the latter will become immune to boll-weevil punctures sooner than the small bolls.

The increased planting of small-bolled varieties after the invasion of the boll-weevil was largely the result of the popular idea that such varieties offered the best prospect of profitable production under weevil conditions. But there is ample evidence to show that equal or larger yields can be obtained from well-selected big-bolled varieties under most of the conditions that prevail in the Cotton Belt. Along the northern rim of the belt, where the seasons are shorter, better average results may be expected from varieties with somewhat smaller bolls. Also, in the more humid districts, difficulties may be encountered in wet seasons with varieties having very large bolls requiring a longer period to dry out and open.

From a practical standpoint an important economic advantage for the big-bolled varieties comes in the harvest season. Since it requires about the same length of time to pick 100 small bolls as it does to pick 100 large bolls, and since the latter weigh from 25 to 50 per cent. more than the former, pickers can gather the big-bolled crop much more quickly and cleanly, thus obtaining higher average grades at less cost.

The popular belief that a higher percentage of lint proves the superiority of a variety has cost American cotton growers many millions of dollars annually and has led to further deterioration of varieties, rather than to improvement. High lint percentage gives no assurance of large yields per acre, but may be the result of smaller or lighter seeds and may characterise weak or unproductive varieties.

The custom of evaluating a variety of cotton by percentage of lint should not give the farmer the idea that the lint percentage is a true standard for judging varieties for planting. The practical question of how to produce the most fiber per acre has no relation to the percentage of lint obtained from a wagon-load of seed cotton at the gin.

The farmer must consider the lint percentage in relation to other questions of practical importance such as the size and weight of the seeds, the earliness and yield of the variety, and the length and quality of the fiber. It is only when these other qualities are maintained that the higher lint percentages can be accepted as evidence of superiority in a variety or specially selected strain.

The safest and most effective way to judge the merits of a cotton variety is to know, in addition to the lint percentage, the lint index, which is the amount of fiber on 100 seeds. An increase in the weight of fiber on 100 seeds is associated with an increase in the weight of the seeds and fewer bolls of such cotton are required to produce a pound of fiber. Thus the lint index is an important factor in the cost of production, because any increase in the weight of fiber from 100 seeds without change in the percentage of lint reduces the labour of picking and thereby increases the efficiency of the pickers. Varieties with high lint percentage should not be selected unless they have the other desirable qualities.

Uniformity in length is one of the important factors in the spinning quality of cotton fibers. The ideal cotton, therefore, from the standpoint of the spinners and manufacturers, would probably have all the fibers of one length. But, unfortunately, uniformity in cotton fiber is only a relative term, since the natural condition is that the fibers on the seeds differ greatly in length. For example, in a variety with 1⅛ inch staple, each seed will have fibers ranging in length from the short fuzz immediately covering the seed, through the successive lengths called linters and sub-staple, to the commercial staple length, and commonly up to 1⅝ inches or longer. While this range of fiber length on the individual seed has been known to cotton breeders for a long time, the importance of taking this natural condition of fiber development into account in breeding and selection has not been fully appreciated until recent years.

Since it is not to be expected that complete uniformity of fiber length can be attained in any variety through breeding, one of the problems of the breeder will be to develop a variety with the highest possible percentage of the fibers falling within a narrow range of length. That varieties do differ in the percentages of fibers of different lengths on the seed, and that the fiber of varieties remains more uniform under variable conditions of production, have been indicated.

Much remains to be learned about the relation of spinning quality to fineness, spirality or natural twist, maturity, and physical structure of the fibers. These and other related characters are being intensively studied by breeders and fiber technologists in the Department of Agriculture and in State institutions, as well as by cotton spinners and manufacturers.

### Cluster Varieties

Many so-called "cluster cottons" with very short-jointed fruiting branches have been advertised and sold as very productive new varieties. The cluster cottons usually appear very fruitful in the fields because the white cotton shows in large masses where the bolls are crowded together, and sometimes large crops are produced under favourable conditions. In the extreme cluster forms, several bolls may be fused or grown together into what appears to be a single boll with as many as 12 or 14 locks.

A detailed study has shown the cluster habit of growth to be a result of abnormalities in the formation of the branches, which explains the tendency toward sterility. Since this apparently is a general feature of the cluster cottons, it is possible to over-estimate the value of the extremely close-jointed type of plant.

None of the cluster cottons has attained more than temporary popularity, as the yields usually are very irregular, and many of the plants may be entirely sterile when the seasonal or other conditions are unfavourable. Other objectionable characters are irregularity in fiber length, excessive shedding under unfavourable conditions, and the difficulty in picking, or keeping trash out of the lint where it causes lower grades. In addition, many of the pedicels or flower stems have imperfect joints at the bases, which prevent the buds and bolls that ordinarily would be shed from being detached and falling to the ground. This is very undesirable under weevil conditions, since the natural control of the weevil depends largely on the larvæ being killed in the fallen squares by the heat of the sun.

### Novelty Varieties

The Department of Agriculture receives many enquiries regarding the possibilities of producing in the United States special types or varieties of cotton as novelties for which high prices would be expected from manufacturers. Two of these varieties that have attracted the most interest in recent years are one producing coloured fiber and a type called "wool" cotton with short wiry fiber.

A variety of cotton with greenish lint, sometimes called "Texas wool", has many times been brought to the attention of the Department by farmers interested in its possible commercial value. While the greenish lint is the natural colour of the fiber, it does not represent a recognized or desirable variety, but a chance variation that appears occasionally in the fields of white cotton, like red ears in fields of corn. The fibers are weak and irregular like the short fuzz of the seed, which, in some varieties, has a greenish colour. It has been reported that a few bales of this fiber have been raised by farmers who hoped that such a novelty would prove valuable, but could find no market for it.

Many varieties of cotton producing coloured fiber are found in tropical America as well as in the Old World, but the fiber is chiefly used for homespuns in the countries in which it grows and is not exported. The range of colour is from lint buff to a rather deep rusty brown. Several of the brownish linted cottons of tropical America resemble the upland cotton grown in the United States, but many belong to the tree-cotton group, which probably could be separated botanically into several species. Samples of cotton cloth made from brown lint have been taken from Indian graves of great antiquity in Peru and other tropical American countries.

In view of the modern development of the art of dyeing, the importance of naturally-coloured fiber is easily over-estimated. The coloured fiber would need to have some other desirable characteristics to justify its industrial use, whereas most of the coloured variations are distinctly inferior to the white fiber of the same type.

The attention of the Department has many times been called to the variety of cotton with short, coarse, wiry fiber, known as "Garo Hill", or in some localities as "wool" cotton. This cotton came originally from the Garo Hill of North-Eastern India. Small quantities of rough Asiatic cotton similar to the Garo Hill have been imported and used in the United States in the manufacture of blankets, usually at prices somewhat below those of American unplanted cotton.

The possibility of producing such cotton in the United States has received attention at the request of manufacturers, but in most cases it has been difficult to get a stand, yields have been low, and the crop is subject to severe damage in stormy weather. It is also difficult to gin the wool cotton on the regular saw-gins, on account of the small size of the seeds, but ways of overcoming this difficulty probably could be found if the crop were satisfactory in other respects.

In plantings made several years ago in Florida, Texas and South Carolina, after a severe rain and windstorm most of the crop had fallen out upon the ground. This tendency of the fiber to fall out of the bolls if not picked promptly renders this cotton poorly adapted to cultivation in the United States. In China the pickers are kept continuously in the fields and the cotton is gathered soon after the bolls open.

On this basis of the results of many years of experimentation by Federal, State, and private investigators, the best advice to American cotton farmers is to leave the novelty cottons alone, and devote their time and energies to the co-operative production of standard, improved varieties that experience has shown offer the best long-time prospects of profitable production.

—*"The Yearbook of Agriculture, 1933," U.S. Dept. of Agriculture.*

## The Maynard Ganga Ram Prize

In 1925, the late Sir Ganga Ram, KT., C.I.E., M.V.O., R.B., Lahore, with that generosity for which he was so well known, handed over to the Punjab Government a sum of Rs. 25,000 for the endowment of a prize of the value of Rs. 3,000, to be called the Maynard Ganga Ram Prize and to be awarded every three years, for a discovery, or an invention, or a new practical method which will tend to increase agricultural production in the Punjab on a paying basis. The competition is open to all throughout the world. Government servants are also eligible to compete for it.

Entries for the next award were invited by the 31st December, 1933. None of the entries was considered to be of sufficient merit and it has been decided by the Managing Committee of the Prize that the award should be postponed for another year and that further entries should reach the Director of Agriculture, Punjab, Lahore, on or before the 31st December, 1935.

849-35.—Printed at The Bangalore Press, Mysore Road, Bangalore City,
by T. Subramania Aiyar, Superintendent.

28